IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Thomas P. Glenn, Steven Webster, Markus K. Liebhard		
Assignee:	Amkor Technology, Inc.		
Title:	CHIP SIZE IMAGE SENSOR WIREBOND PACKAGE FABRICATION METHOD		
Serial No.:	09/712,314	Filed:	November 13, 2000
Examiner:	Alonzo Chambliss	Group Art Unit:	2827
Docket No.:	G0026M		

Monterey, CA
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CLEAN COPY OF REPLACEMENT CLAIMS

Replace the pending set of claims in the above application with the following set of claims:

2. (AMENDED) The method of Claim 13 wherein said mounting a step up ring comprises directly mounting a first surface of said step up ring to said noncritical region.

3. (AMENDED) The method of Claim 13 wherein said step up ring is mounted around said window.

4. (AMENDED) The method of Claim 3 wherein said window is located in or adjacent said central aperture.

5. (AMENDED) The method of Claim 13 wherein said sensor device is one of a plurality of sensor devices integrally connected together in a wafer.

6. (AMENDED) A method comprising:

mounting a window above an active area on a first surface of a sensor device, said sensor device comprising a bond pad on said first surface, wherein said sensor device is one of a

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plurality of sensor devices integrally connected together in a wafer;

mounting a step up ring above a noncritical region of said first surface between said bond pad and said active area, wherein said step up ring is one of plurality of step up rings integrally connected together in a sheet, said method further comprising mounting a first surface of said sheet to a first surface of said wafer; and

electrically connecting a trace on said step up ring to said bond pad.

7. The method of Claim 6 further comprising singulating said wafer.

8. (AMENDED) The method of Claim 13 wherein said mounting a step up ring comprises mounting a first surface of said step up ring to a window support layer above said noncritical region.

9. The method of Claim 8 wherein said window is mounted above said active area by said window support layer.

10. (AMENDED) The method of Claim 13 wherein said window is mounted above said active area by a window support.

11. (AMENDED) The method of Claim 13 wherein said electrically connecting a trace on said step up ring to said bond pad comprises wire bonding said trace to said bond pad with a bond wire.

12. (AMENDED) The method of Claim 11 wherein said package body is a first package body, said method further comprising forming a second package body to enclose said bond wire.

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13. (AMENDED) A method comprising:

mounting a window above an active area on a first surface of a sensor device, said sensor device comprising a bond pad on said first surface;

mounting a step up ring above a noncritical region of said first surface between said bond pad and said active area, wherein said step up ring comprises a central aperture;

electrically connecting a trace on said step up ring to said bond pad; and

filling said central aperture with an encapsulant to form a package body.

14. The method of Claim 13 wherein said mounting a step up ring above a noncritical region comprises mounting said step up ring around said window such that said window is located in or adjacent said central aperture.

15. (AMENDED) The method of Claim 13 wherein said sensor device is an image sensor.

16. The method of Claim 15 wherein said active area is responsive to radiation.

18. (AMENDED) The method of Claim 20 wherein said directly attaching comprises directly attaching said first surface of said step up ring to said first surface of said sensor device with adhesive.

19. (AMENDED) The method of Claim 24 wherein said sensor device comprises a bond pad on said first surface of said sensor device, a noncritical region of said first surface of said sensor device being between said active area and said bond pad, said directly attaching comprises directly attaching said first surface of said step up ring to said noncritical region.

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20. (AMENDED) A method comprising:

mounting a window above an active area on a first surface of a sensor device;

directly attaching a first surface of a step up ring to said first surface of said sensor device, said step up ring being mounted around said window; and

electrically connecting said bond pad to an electrically conductive trace on a second surface of said step up ring, wherein said sensor device comprises a bond pad on said first surface of said sensor device, a noncritical region of said first surface of said sensor device being between said active area and said bond pad, said directly attaching comprises directly attaching said first surface of said step up ring to said noncritical region.

21. The method of Claim 20 wherein said electrically connecting comprises forming a bond wire between said bond pad and said trace.

22. The method of Claim 20 further comprising forming an interconnection ball on said trace.

23. (AMENDED) The method of Claim 20 wherein said sensor device is one of a plurality of sensor devices integrally connected together in a wafer.

24. (AMENDED) A method comprising:

mounting a window above an active area on a first surface of a sensor device, wherein said sensor device is one of a plurality of sensor devices integrally connected together in a wafer; and

directly attaching a first surface of a step up ring to said first surface of said sensor device, said step up ring being mounted around said window, wherein said step up ring is one of plurality of step up rings integrally connected together in a sheet; and

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mounting a first surface of said sheet to a first surface of said wafer.

25. The method of Claim 23 further comprising singulating said wafer.

26. A method comprising:

mounting a window above an active area of an image sensor by a single window support layer having a first surface in contact with a first surface of an image sensor substrate comprising said image sensor; and

directly attaching a first surface of a step up ring to a second surface of said window support layer, said step up ring being mounted around said window.

27. The method of Claim 26 wherein said image sensor comprises a first surface, said active area and a bond pad of said image sensor being on said first surface of said image sensor, a noncritical region of said first surface of said image sensor being between said active area and said bond pad, said step up ring being mounted above said noncritical region.

28. The method of Claim 27 further comprising electrically connecting said bond pad to an electrically conductive trace on a second surface of said step up ring.

29. The method of Claim 26 further comprising singulating said image sensor substrate.

CERTIFICATE OF MAILING

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Attorney for Applicant(s)

January 8, 2003
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